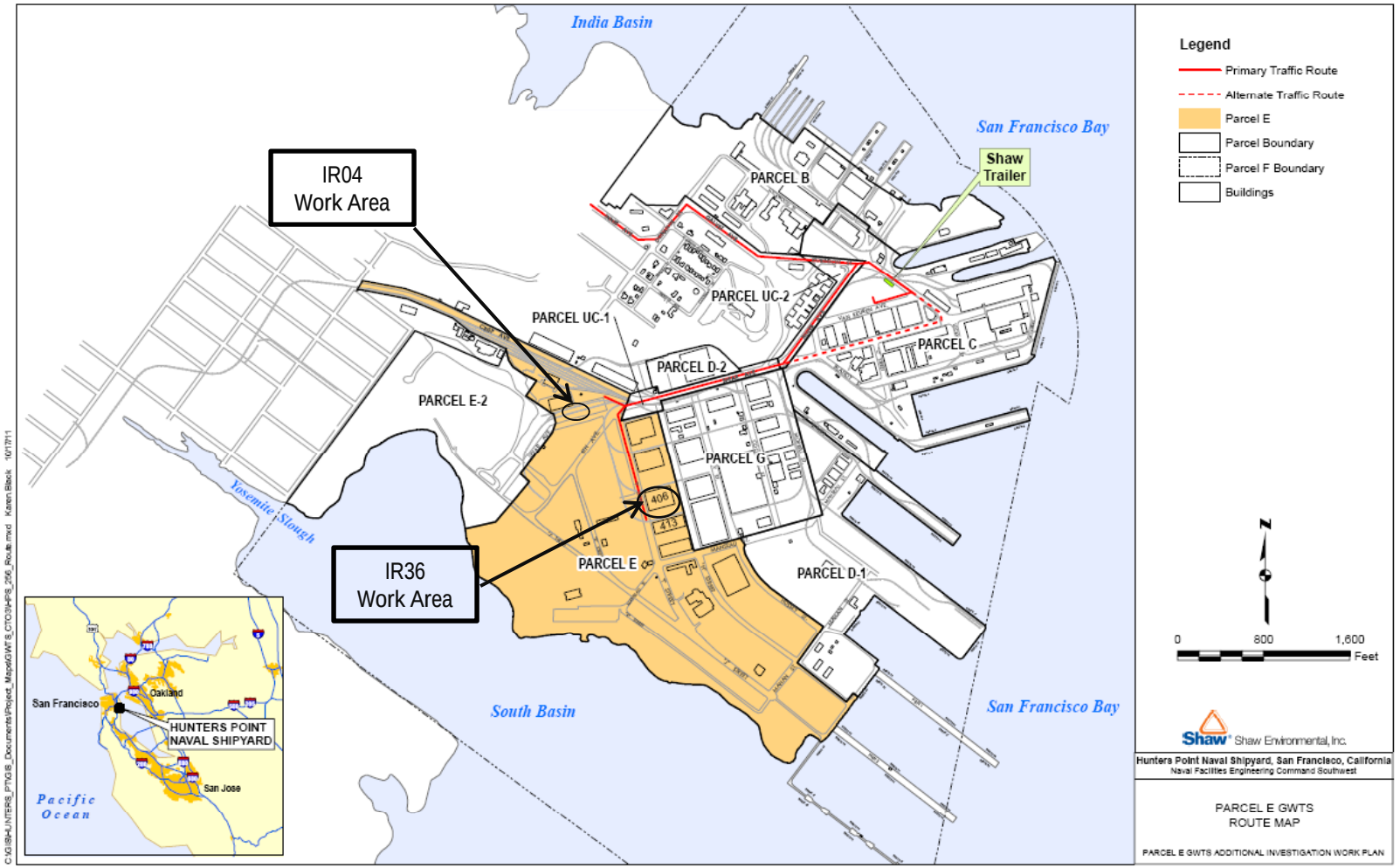
Parcel E Groundwater Treatability Study (GWTS) Additional Investigation

Hunters Point Naval Shipyard
BCT Meeting
December 6, 2012

Overview

- Completed field activities for the original scope of the GWTS in Parcel E
  - VOC Plume Characterization work at IR04, IR12, IR36, IR56 completed in November 2009
  - ZVI injections at IR12A completed in December 2009 and at IR36 (Building 406) completed in March 2010
  - Post-injection sampling completed in June 2010 (with continued BGMP sampling of selected wells)
- The final GWTS technical report was submitted in May 2011
- Soil vapor data indicated the potential presence of a vadose-zone source for TCE at IR04 and IR36
- The additional investigation field work to evaluate potential vadose-zone sources of TCE at IR04 and IR36 was completed in September 2012

Parcel E and Work Area Locations at R04 and IR36

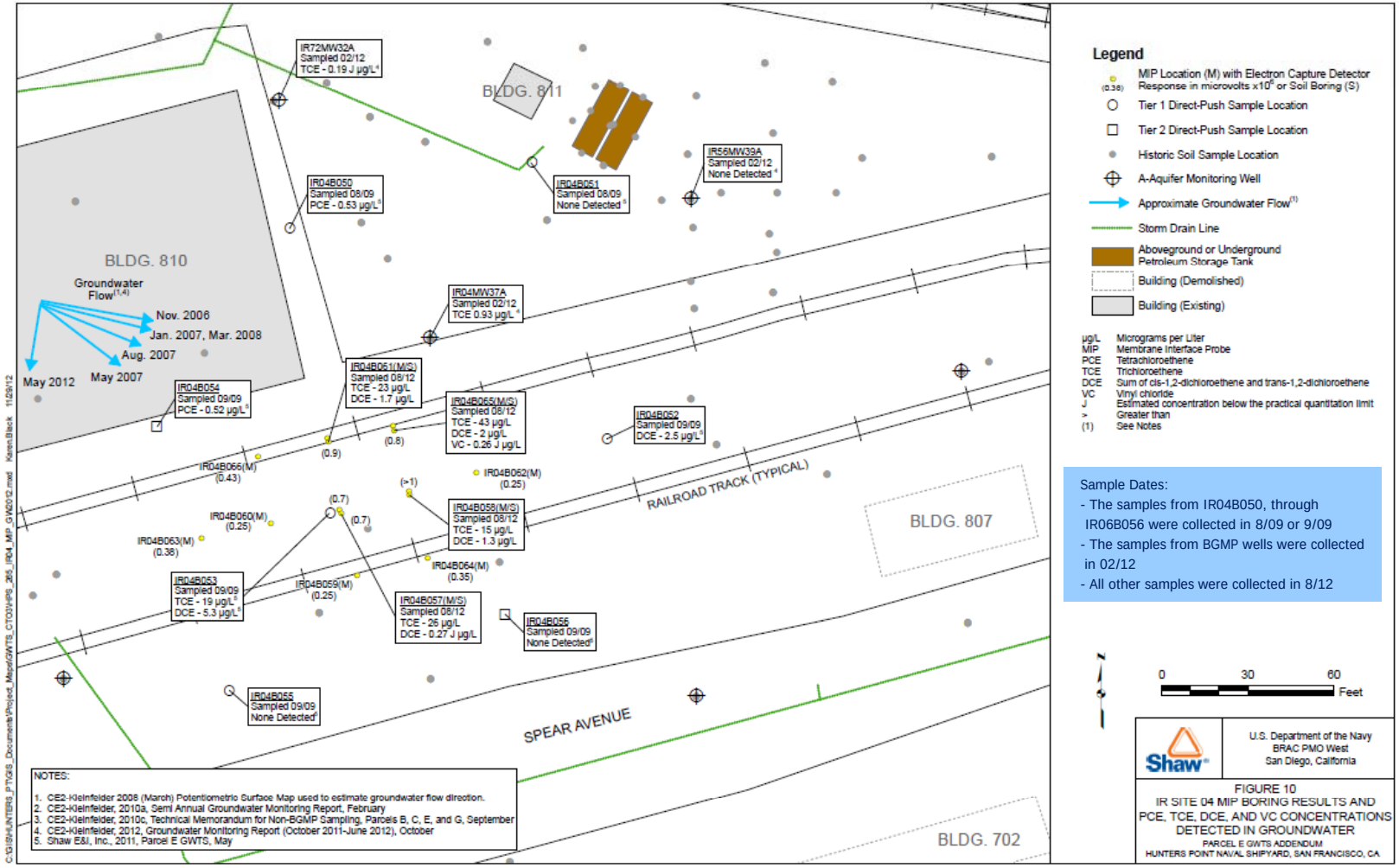


Overview (Continued)

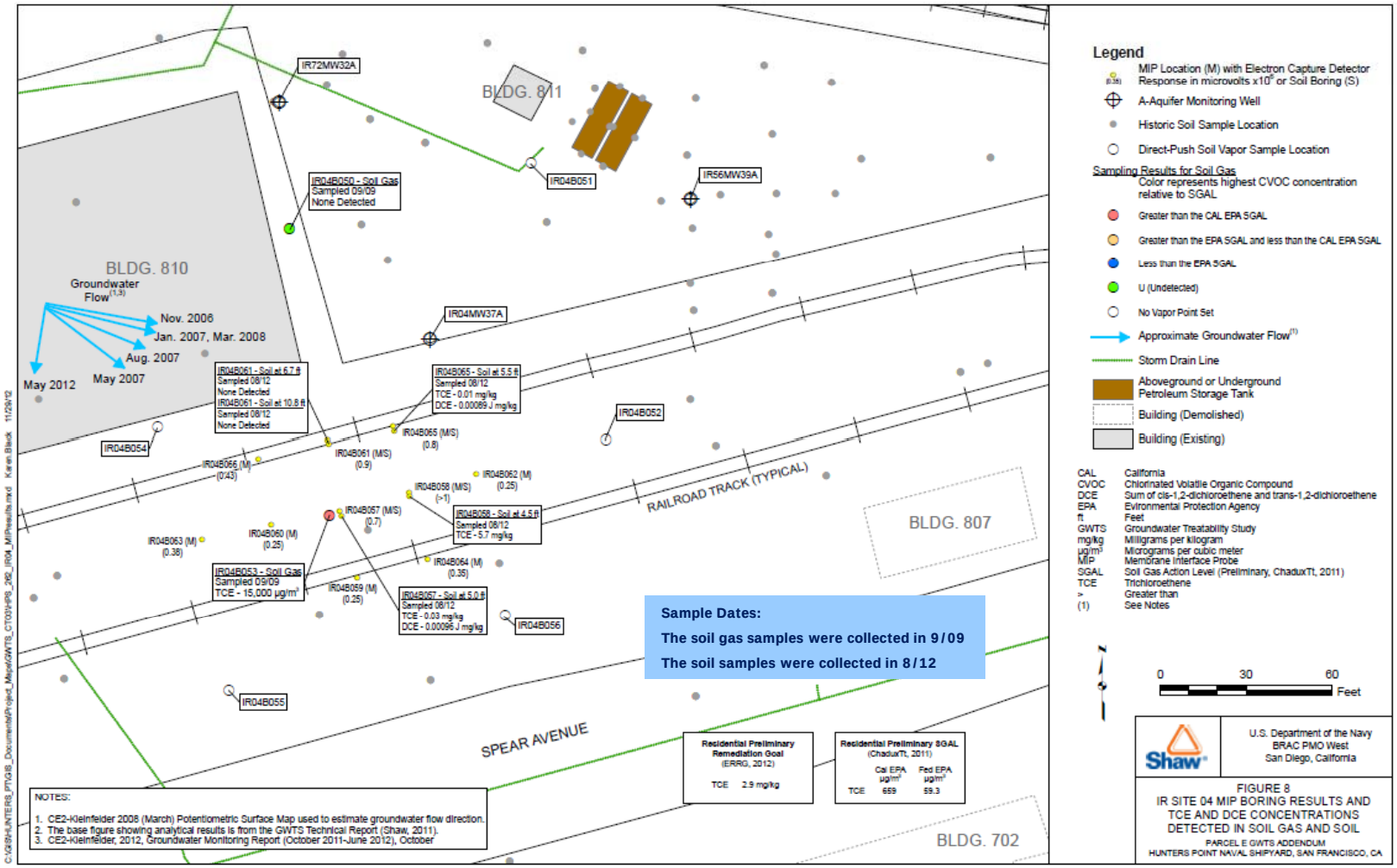
- The additional investigation included the following:

1. Soil gas sampling was conducted to confirm current conditions (completed in July 2012).
2. Membrane interface probe (MIP) borings were drilled to obtain semi-quantitative data on CVOC concentrations in the subsurface and soil texture (completed in August 2012).
3. Soil borings were drilled to collect soil and groundwater grab samples for laboratory analysis from the depths where the highest relative CVOC concentrations were indicated on the electron capture detector (ECD) of the MIP (completed in September 2012).
4. The sampling was conducted on a grid system similar to the pre-ZVI-injection sampling during the GWTS, but using a closer (25') spacing.

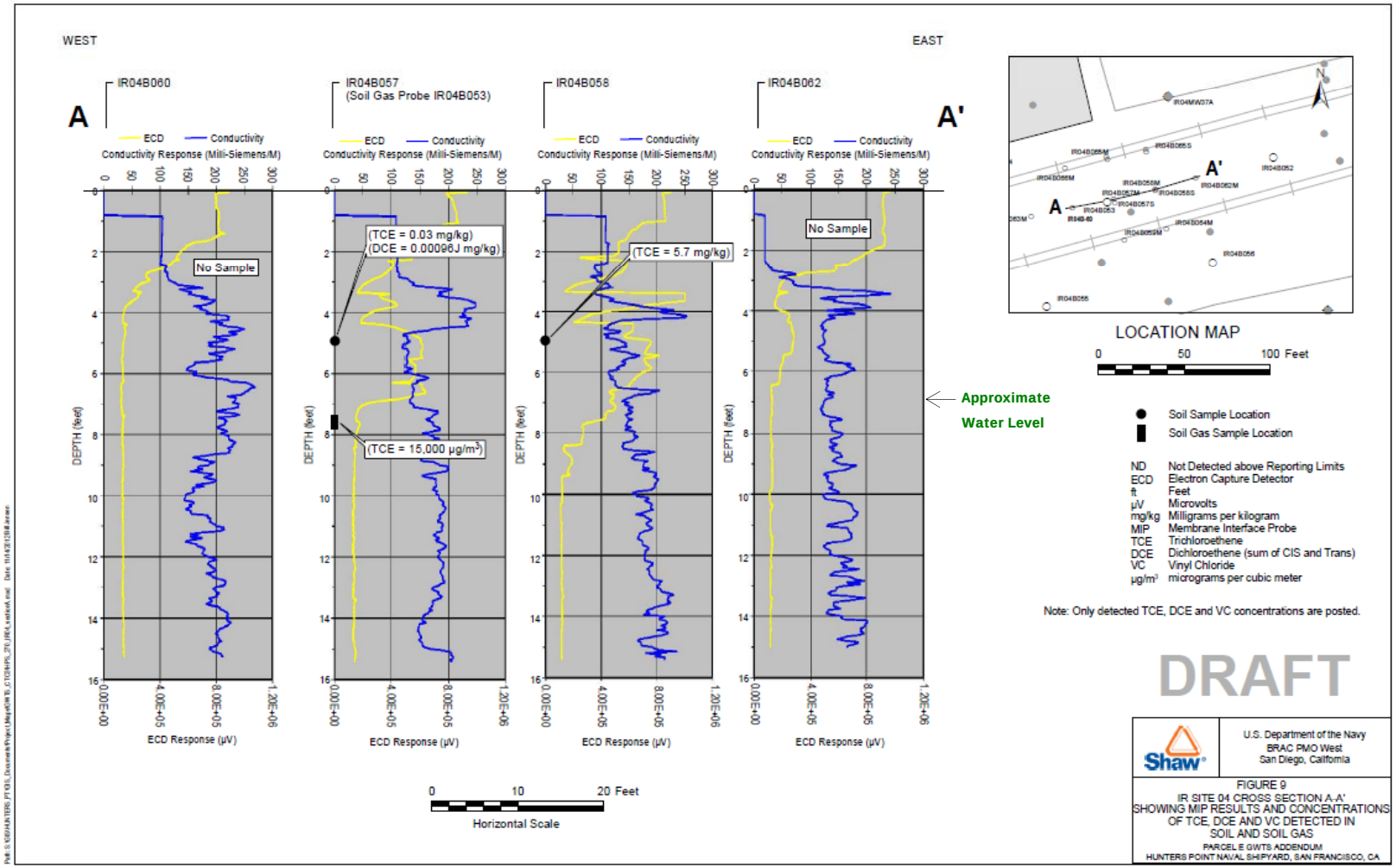
IR04 – MIP and Groundwater Results



IR04 - MIP, Soil, and Soil Vapor Results



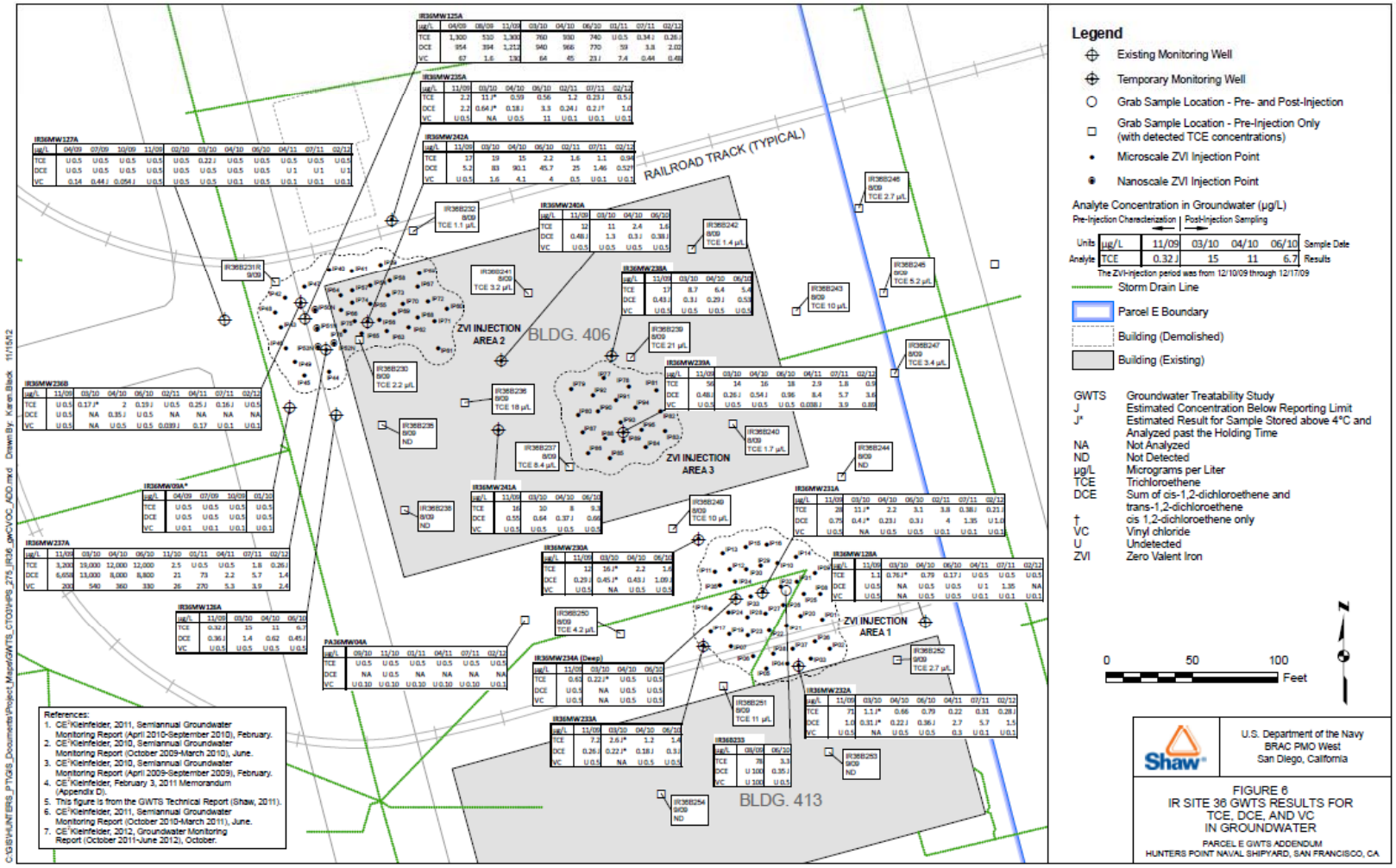
IR04 Cross Section – MIP, Soil, and Soil Gas Results



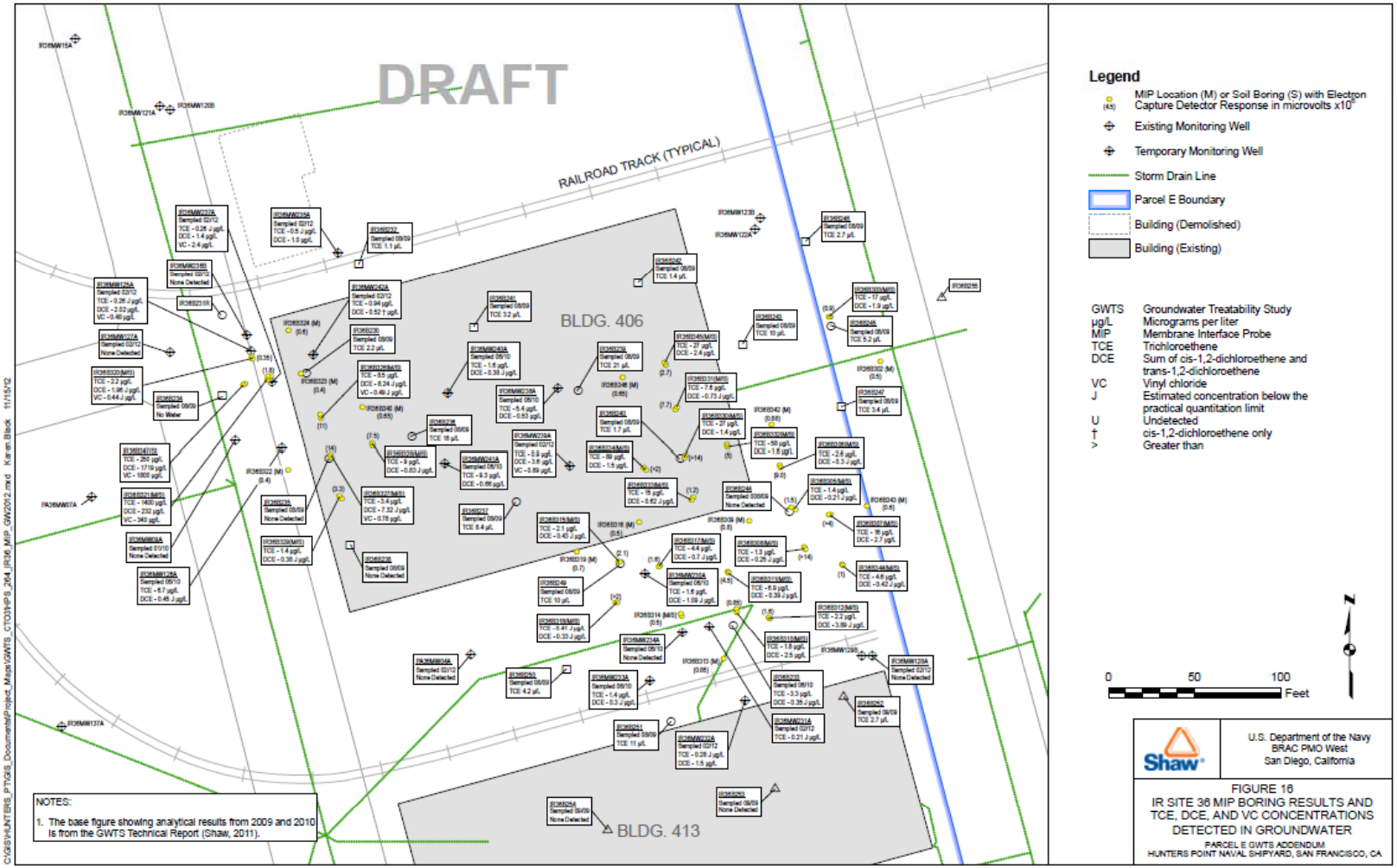
Summary of IR04 Results

- The highest ECD responses were generally observed between 3 and 6 feet below ground surface (bgs) – this is within the vadose-zone.
- The highest ECD response was observed at IR04B058, and the highest reported TCE concentration in soil (5.7 mg/kg) was reported in the sample obtained from the boring located adjacent to this MIP boring.
- The TCE detected in the vadose-zone soil is likely a significant contributor (relative to TCE in groundwater) to the TCE detected in soil gas in this area.

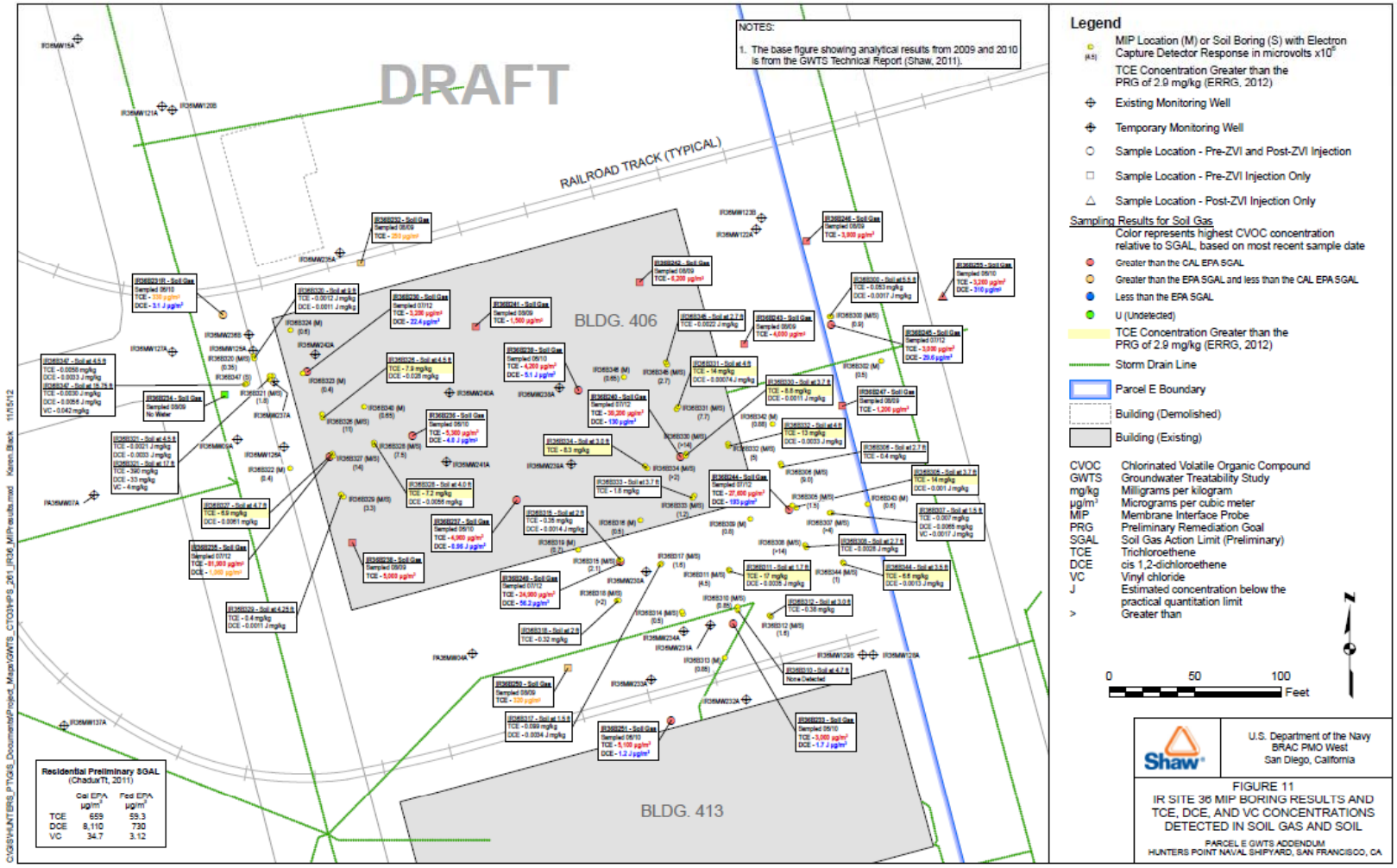
IR36 - ZVI Injection Locations and GWTS Analytical Data for Groundwater



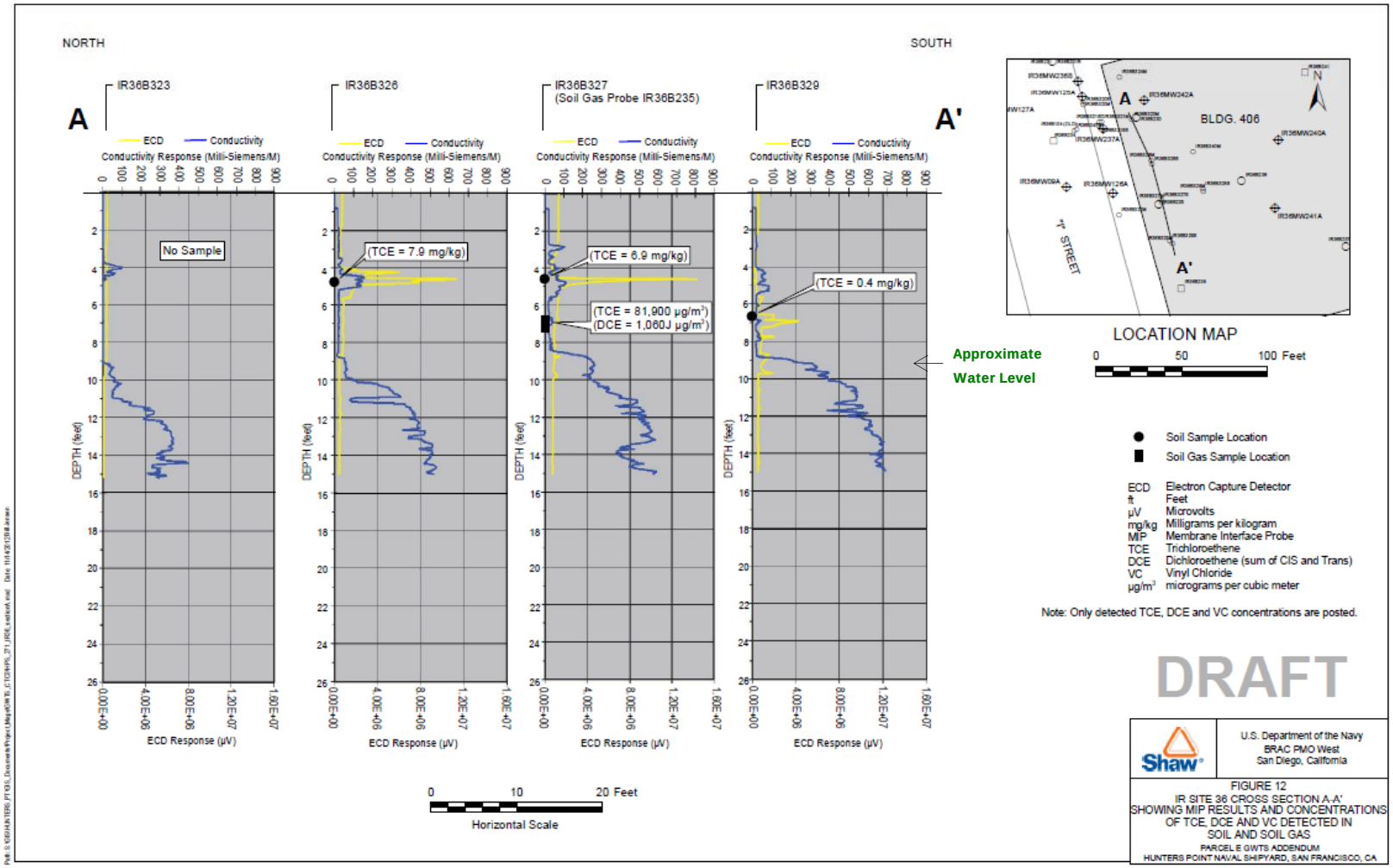
IR36 – MIP and Groundwater Results



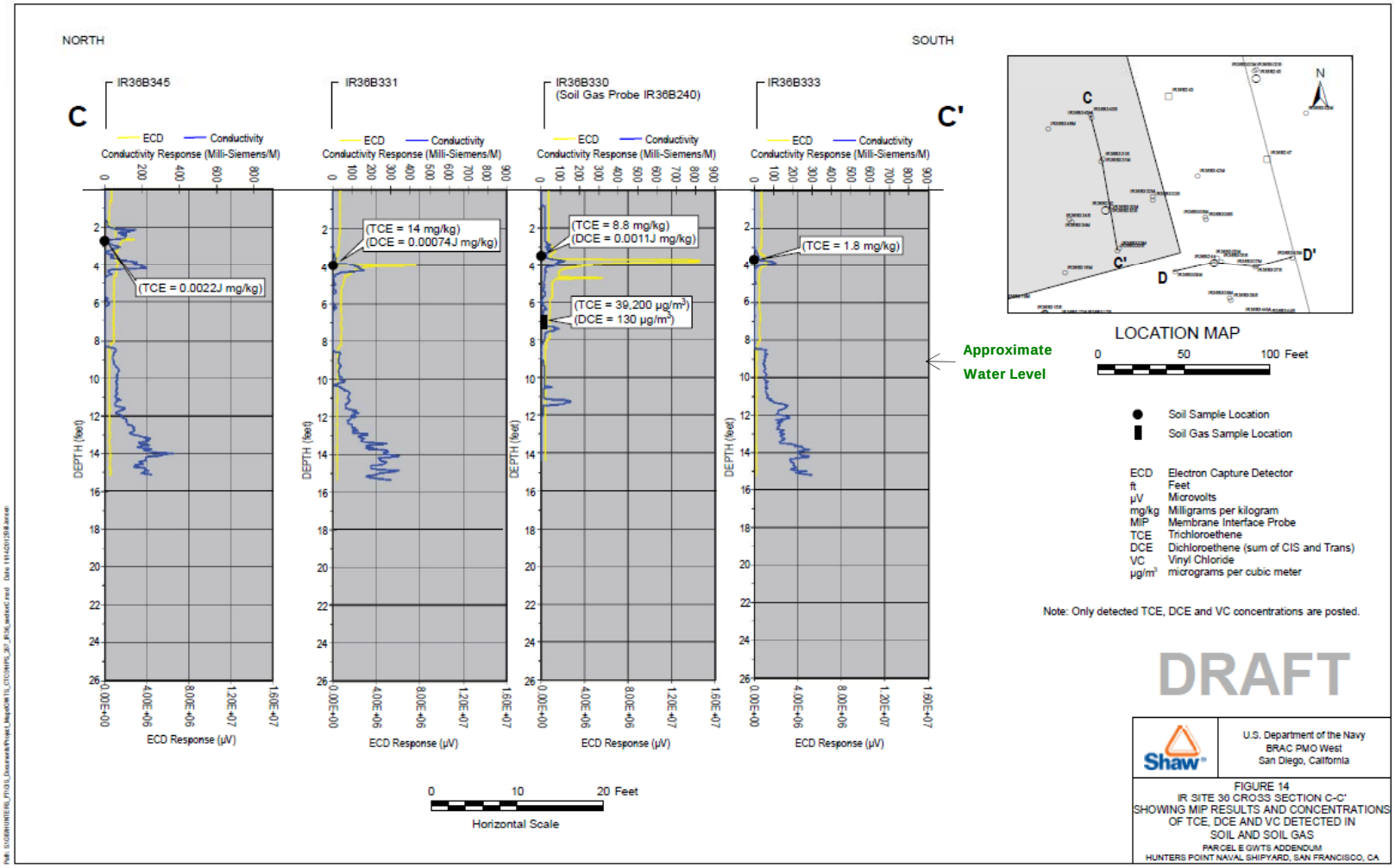
IR36 – MIP, Soil Gas, and Soil Results



IR36 Cross Section A-A' – MIP, Soil, and Soil Gas Results



IR36 Cross Section C-C' – MIP, Soil, and Soil Gas Results



Summary of IR36 Results

- There were three general areas of highest, vadose-zone MIP response - 1) outside the southeast corner of Bld 406, 2) inside the southeast corner of Bld 406, and 3) inside the west end of Bld 406. The highest ECD response was generally observed between 3 and 5 feet bgs at each location.
- The highest TCE concentrations in vadose-zone soil in each of these areas were 17 mg/kg outside the southeast corner of Bld 406, 14 mg/kg inside the southeast corner of Bld 406, and 7.9 mg/kg inside the west end of Bld 406.

Summary of IR36 Results (Continued)

- The highest MIP ECD generally was coincident with a zone that contained a greater proportion of fine-grained particles than the surrounding soil.
- The TCE detected in the vadose-zone soil is likely a significant contributor (relative to TCE in groundwater) to the TCE detected in soil gas in this area.

Summary of IR36 Results (Continued)

- Zones of relatively high CVOC concentrations in groundwater are present outside the northwest corner of Bld 406 where ZVI was injected.
- Migration of the CVOCs in these zones is attenuated by a combination of: 1) the low permeability of the Bay Mud unit, 2) anaerobic degradation (TPH serves as the substrate for bacteria in the aquifer), and 3) degradation due to contact with the ZVI that was placed in factures created during the injection process (these ZVI-filled fractures may be preferential pathways for CVOC migration through the Bay Mud unit)

Schedule Summary

• Kick-Off Meeting for Additional Work (complete)	Sept. 19, 2011
• Work Plan (Addendum) Final (complete)	July 9, 2012
• Sample Existing Soil Gas Monitoring Wells (Complete)	July 2012
• MIP Borings (Complete)	August 2012
• Drill and Sample Soil Borings (Complete)	September 2012
• Draft Technical Report Addendum to BCT	December 20, 2012
• Final Technical Report Addendum to BCT	March 6, 2013

Contact Information

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